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IN THE

Supreme Court of the United States

OCTOBER TERM, 1965

No. [redacted]/154

SERVO CORPORATION OF AMERICA,
Petitioner,

vs.

GENERAL ELECTRIC COMPANY,
Respondent.

PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FOURTH CIRCUIT

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Petitioner, Servo Corporation of America, prays that a writ of certiorari issue to review so much of the judgment of the Court of Appeals for the Fourth Circuit in the above entitled case as adjudges invalid United States Patent No. 2,880,309 issued March 31, 1959.

Opinions Below

The opinion of the Court of Appeals is reported at 337 F. 2d 716, and is reprinted in the Appendix hereto, A1-A19.* The opinion of the District Court is reported at 220 F. Supp. 473; is reprinted in full at 149a-183a** of the certified transcript; and that portion

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* Appendix to this Petition for Certiorari so indicated herein.

** Petitioner's Certified Appendix in the Court of Appeals so indicated herein.

thereof relating to the validity of U.S. patent 2,880,309 is reprinted in the Appendix hereto, A20-A39. The Report of a Special Master, appointed pursuant to Rule 53, Federal Rules of Civil Procedure, is reprinted in full at 11a-142a of the certified transcript and that portion thereof relating to the validity of U.S. patent 2,880,309 is reprinted in the Appendix hereto, A42-A77.

Jurisdiction

The judgment of the Court of Appeals was entered on September 30, 1964 (A19). A timely Petition for Rehearing In Banc, with respect to so much of the judgment of the Court of Appeals as reversed the judgment of validity of U.S. patent No. 2,880,309 made by the District Court (A40-A41), which in turn had confirmed a Conclusion of validity made by the Special Master (A77-A78), was filed on October 30, 1964. The Petition for Rehearing was denied and an order entered thereon on February 19, 1965 (A20-A21).

The jurisdiction of this Court is invoked pursuant to 28 U.S.C. Sec. 1254(1). The basis of jurisdiction in the District Court was 28 U.S.C. Sec. 1338(a) and 35 U.S.C. Sec. 281.

The Questions Presented

1. Where the District Court and the Special Master specifically found as facts:

> (a) The railroads for many years were plagued by hot journal boxes and although serious train wrecks costing hundreds of thousands of dollars were caused by such overheated journals, nothing was accomplished toward their prevention or detection despite

the fact that there had been a continuing search by the railways and others interested in finding a way by which the overheated journal boxes could be detected before appreciable harm was done (A42-A44, A22);

(b) There were many perplexing technical problems involved in an attempt to successfully detect hot journal boxes by infrared radiation (A51-A52) and the General Electric Company itself, even as found by the Court of Appeals, after ten years of experimental work, abandoned its research and reported the infrared detection of hot journal boxes involved some difficult problems in practical application (A13-A15);

(c) Despite specific requests by railroads to General Electric to develop equipment for the detection of hot journal boxes, G.E. and other large companies, such as International Telephone and Telegraph Co., "never succeeded in solving the problem" (A44-A45, A69-A74, A36-A37) and "of the many experts versed in the art who tackled the problem, none solved it prior to" the invention of the patent in suit and "a few even reached the conclusion that the task was impossible" (A63);

(d) There was admittedly no anticipation in the prior art; nor was there any prior art which would constitute a sufficient teaching to enable one skilled in the art to construct an operable detector embodying the features of the '309 patent; and the patent issued only, as found on the basis of oral expert testimony, after a rigid examination in the Patent Office (A75-A77); and

(e) The invention of the patent constituted a "breakthrough in the hot journal box detection field"

(A57); had the characteristics of a "pioneer" patent (A63); was the "first working answer" to the problem (A37); and received wide industry acclaim as the solution (A63),

the question is presented: Whether the irrefutable* presence of these objective criteria establishes the invention of the patent in suit as an advance in the art promoting the progress of science within the true meaning of Sec. 8, Article I of the Constitution; far removes it from the class of "gadget inventions" condemned by this Court in *Great Atlantic & Pacific Tea Co.* v. *Supermarket Equipment Corp.*, 340 U.S. 147 (1950) and in fact meets the reputedly high standard of invention of that case?

II. Where there has been an unusual and extensive consideration of complicated technical facts, adduced on oral testimony, as in this case where:

(a) The trial of the action involved a total of 33 trial days, a record of 6,541 pages and some 733 exhibits (14a);

(b) The trial of the action, the examination of witnesses and statements of evaluation and analysis of documentary evidence, were all had before *both* triers of fact below, the District Court and the Special Master (A22-A23);

(c) The Special Master, devoting more than 800 hours to the case and a consideration of the evidence, filed a 148 page Report sustaining the validity of the patent and making special note of the weighing of oral testimony; and the District Court, after hearing four days of oral argument, also filed a 34 page opinion confirming the Master's Report in this respect; and

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* Servo Corporation's Petition for Rehearing A80-A82.

(d) The recital of facts by the Court of Appeals is directly contrary to the specific findings made by the triers of fact below with respect to those matters the Court evaluated in testing the claims of the patent against the standard or requirement set forth in the statute relating to non-obvious subject matter (Petition for Rehearing, A80-A93).

the question is presented: Whether this Court should not once again exercise its supervisory powers and call to the attention of the Courts of Appeal the judicial discipline prescribed by Rule 52 of the Federal Rules of Civil Procedure, requiring the Court of Appeals, before it applies a rule of law, or in this case a standard of invention, to a set of specific facts different from those found by the trial court and the master, to specifically find by its own analysis of the record, that such specific findings were clearly erroneous?*

Constitutional Provision and Statutes Involved

This case involves Article I, Sec. 8, Clause 8, of the Constitution, Section 103 of the Patent Code of 1952, 35 U.S.C. 103 and Rule 52(a) of the Federal Rules of Civil Practice, all of which are set forth in the Appendix at A79.

Introductory Statement and Reasons for Granting Writ

We are deeply convinced that the decision of the Court of Appeals has resulted in a substantial injustice; that the invention of the patent in suit, created a new scientific

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* This the Court of Appeals declined to do in its original opinion (A9) and again (A19), when specifically requested to do so in the Petition for Rehearing (A80).

device and an industry which did not previously exist; that the invention of the patent in suit, does not require us to contend for a moderate standard of invention, but in fact meets the "rather severe test" prescribed by this Court in the *A. & P.* case; and that this Court never intended to strike down inventions of the scientific nature of the one in suit by a mechanical or subjective application of a general definition, evolved in another case involving a mechanical "gadget" type device.

Just as this Court has recently indicated significant interest and concern in cases which reflect a lax standard of invention, there should be a correlative interest and concern in cases where the standard of invention is applied in such a rigid and unduly harsh manner, as to render impotent, not only the Constitutional intent of reward in proper cases, but also the incentive to the creation of new and useful things, protection for which permits the individual or the small company to find an entry into industrial life and competition without suffering the abortion caused by immediate appropriation by the more powerful members of the community they seek to join.*

We believe that the facts in this case significantly speak for themselves with respect to the injustice of the result and with respect to the proper application of the standard of invention, ~~and because~~ We believe the facts

* U. S. Senate, Committee on the Judiciary, 84th Congress, 2nd Sess., Sen. Res. 167, "Patent System and the Modern Economy", Study No. 2, p. 15. "The patent system performs an indispensable function in stimulating investment of capital in new manufacturing enterprises. The obstacles in entry into a new business are always great. Existing firms inherently have the advantages of going concerns, adequate capital, a proven product and established customer and supplier relations. The newcomer—even it has a corps of unusually gifted personnel—has a heavy burden in attempting to overcome these many disadvantages. If, however, the new enterprise develops and manufactures a patented product these disadvantages are balanced in some measure by the exclusive market available."

here will afford this Court an opportunity to consider the proper test of invention and its proper application with respect to subject matter which represents the other end of the scientific or technological spectrum in relation to the subject matter of the patents in cases which this Court presently has under consideration,* such as *Calmar, Inc.* v. *Cook Chemical Co.*, October Term, 1964, No. 778 and *Graham* v. *John Deere Co.*, October Term, 1964, No. 580 and that it aptly comes within the request of the Solicitor General to this Court to review a number of cases involving the standard of invention in order to provide a "broad perspective". *United States* v. *Adams*, October Term, 1964, No. 906.

Statement of Facts

The Servo Corporation was formed in 1946 by personnel of Fairchild Camera & Instrument Company who had been engaged in infra red guided missile work until the termination of World War II. At first it engaged primarily in engineering research and development work for the government in infra red technology and later, to provide a stable product line and level of employment necessary to the existence of a small business entity it began to develop infra red devices for industrial applications. Complex technical factors presented considerable problems in attempting to adopt infra red military device technology to industrial applications (184a-189a).

The General Electric Company is one of the largest companies in the world engaged in the development and manufacture of a great variety of products in the elec-

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* For this reason we have set forth the facts in this Petition and supplemented the Appendix to a slightly greater degree than usual but at the same time have sincerely tried to stay within the reasonable limits of a Petition for Certiorari, to the degree that a record as extensive as the one below admitted.

tronic, chemical and metallurgical fields, including railroad locomotives and infra red devices (619a-627a). It holds some 10,000 patents on its developments (Committee on the Judiciary, 84th Congress, 2nd Sess., Sen. Res. 167, Study No. 3). General Electric Company began working on means to detect hot journal boxes by thermal sensing means in 1945 and produced a device which was not commercially adopted (601a-602a; 1067a; 1072a). In 1951 a British associate company of General Electric Co. commenced work on the development of an infra red hot journal box detector and in 1952 the General Electric Company in the United States commenced experimental work on a similar device (1238a-1248a). Such work similarly did not result in any device put in operation on railroads (2.133;* 1268a). The Court of Appeals found that General Electric ceased its activities in this field in 1955; admitted there were difficult problems in application; did not resume its activity in the field until 1958 when it inspected, photographed and obtained the drawings of a Servo infra red detector; and within "an incredibly short time was producing detectors embodying many of Servo's engineering features" (A13-A14).

For many years the railroads had been plagued with what was known as the "hot box problem" (295a; 1084a; 1252a; 1324a). The ends of the axles on a railroad car truck are called journals and they ride on a bearing which consists of a semi-circular piece of brass, surrounded by a lubricated packing intended to reduce the amount of friction created by the rotation of the journal, which bears the weight of the railroad car. These elements are enclosed within a housing which is known as a journal box. Due to wear, loss of lubrication and the inherent defects of such a bearing arrangement, sufficient heat can be

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* The Respondent's, General Electric Co., Appendix in the Court of Appeals so designated herein.

generated in the journal box to cause the journal or end of the axle to actually melt and break off. The usual result of such an occurrence, which remains undetected, is a derailment (294a).

Interstate Commerce Commission reports reveal that for the year 1954, railroads suffered 391 derailments due to overheated journals. For the years 1955 and 1956 there were respectively 545 and 831 derailments due to undetected hot journals. The seriousness of the need for some solution to prevent damage caused by hot journals could not be better described than it was in the testimony of personnel of the Association of American Railroads:

> "• • • *the largest and most important single problem in the field of railroad operations;* it is a problem to which many railroad people have given attention; it is a problem on which railroads have consulted outside research organizations and scientists; it is a problem on which the railroads have spent a great deal of money. The failure to solve the problem has cost the railroads even larger amounts of money. • • •" (317a).

The General Electric Co. itself stated:

> "All railroads are faced with the problem of detecting hot boxes on rolling stock, in particular the Chesapeake & Ohio Railroad Company is interested in obtaining equipment for this purpose. Also the PRR and NYC Companies have indicated considerable interest in such equipment (1252a)."

Because of the importance of this problem, the Association of American Railroads, which comprises 99% of all the Class One railroads in the United States, set up a special committee to consider ways and means for the

detection of hot boxes (295a). During the period 1947 to 1952 this committee evaluated numerous devices which had been proposed and tested by various companies (1058a-1072a). None of these devices proved satisfactory because the "continuance of numerous false alarms and alarm equipment failures makes for an overall unsatisfactory and unreliable operation of the alarm devices under observation and the Committee therefore, cannot yet recommend any hot box alarm for general use (1072a)."

The Servo Corporation commenced its experimental and research work on a hot journal box detector in 1952. Several research workers, Howell, Derganc, Willey and McDonald experimented with a variety of devices (336a-359a; 380a-395a; 397a-398a). It was not until March 1955 that Servo began to embody in a physical device any of the ideas which it had considered in connection with the development of a hot-box detector. At this time an authorization was issued for the construction of a "breadboard" model in the nature of "experimental equipment" (378a).

Thereafter, in an attempt to determine what sort of signals could be obtained from journal boxes, the radiation from normal boxes was attempted to be observed in some tests on the Long Island Rail Road, using an ordinary pyrometer. This was primarily a research instrument utilizing a mirror optical system and a periscope to align the axis of the optical system of the pyrometer. The bolometer or heat sensing element was aimed directly at the lid cover at the level of the axles and at first it utilized a three-bladed device as a chopper, which was removed during later experiments. No permanent record was made of the measurements which were simply produced transiently on an oscilloscope tube. The readings obtained

simply indicated that heat sources were present, and there was no way of associating the heat source with the journal box (378a-385a). At this time the chopper was removed and a microphone was added to the test setup so that the sounding of a click on the microphone would identify the presence of a wheel, and an attempt was made to correlate this information with the pulses which were moving across an oscilloscope.

A graphic and a tape recorder were later also used in an attempt to correlate the presence of the wheel, alignment of the bolometer and to identify and discriminate the heat sources from which signals would emanate. The recordings obtained were to a large extent unintelligible and conveyed no accurate information with respect to the reading of hot journal boxes (391a-393a). Mr. Howell in evaluating this work stated there were "a great many problems that developed beyond the experience" that Servo had at the time he was making these original tests (398a).

The technical problem faced by workers in this field evolved around the nature of infra red sensitive devices and the innumerable heat sources on a moving train and in the surrounding atmosphere. Infra red heat sensitive devices do not measure temperature; what they do measure is relative heat, *i.e.* the change in heat radiation, either higher or lower, from what the heat sensing element first "sees" to the next object passing in its view (326a-327a; 472a-477a; 861a). For this reason most prior art infra red devices employed a blade or a chopper which was interposed between the target and the heat sensing element. When the blade was removed, the heat sensing element then observed the target relative to what it had previously been observing, namely the back of the blade or chopper, the temperature of which, or the standard of radiation from which, could be measured or was known, and hence it could be used as a reference (1394a-1401a;

1402a-1404a). In attempting to single out a hot journal box among hundreds of journal boxes on a railroad train moving at 50-60 miles an hour; discriminate between other journal boxes, hot wheel rims, brake shoes, steam hoses and the like; in bright sunlight, snow reflections, night operation and the like; considering the different sizes and configurations of journal boxes, the different size of the wheels—and to do so with a device that had about 10 milliseconds (10/1000 of a second) in which to make an observation relative to what it had previously been observing—the inventors were presented with a task of significant magnitude (A95-A104).* The General Electric Company engineers who had worked on the problem for about 10 years, stated during the course of this work "a serious problem—that of daylight operation—had not been met nor were we very sure of satisfactory solutions in this respect" and that prior work of a British G. E. affiliate "avoided this most serious problem" by testing a device in a tunnel (A101). They also stated that to locate a heat sensing device in such a manner as to avoid extraneous heat sources and observe only journal boxes, without shuttering, on a continuous basis would be a "large order" (A101).

The extensive nature of the experimental work engaged in by the inventors, Gallagher and Pelino, in an attempt to solve these problems, following their taking over of the initial Howell and Derganc work involved many different aproaches to a solution of the problem suggested by the art and by other workers in the field, including a redesign of the amplifier, germanium shutters and filters,

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* In the Appendix we have printed the testimony of third parties, of the Servo witnesses and the G.E. witnesses—there is no contrary record evidence except the unsupported assertions of G.E. counsel that the problem and its solution were simple and obvious—because we cannot at all comprehend how the Court below could have reached the subjective conclusion that it was simple and obvious.

chopping devices, internal electronic references, and the reading of other heat indications such as the wheel. None of these proved satisfactory, the information obtained being largely unintelligible. (425a-428a; 457a-458a; 460a-462a; 470-474a).

As close as Mr. Gallagher could estimate, sometime near the end of April, 1956, he and Mr. Pelino conceived the idea which became the invention of the patent in suit (485a-487a). Reference to Mr. Gallagher's testimony, whose forthrightness and candor was specially noted by the Special Master (A52-A53), serves better than any lawyer's formulation of language to describe the circumstances:

> "Well, after Mr. Pelino had gotten back from the N. & W. test he had pretty much discarded the idea from his own opinion of looking at the top of the box and become resigned to the fact that the rear of the box would be the best place to lock. We were sitting down one day and I had the *Car Builders Cyclopedia* in front of me as we were discussing the problem and we were reviewing the failures that my circuit had encountered on not being able to get a true ambient reference, nad we had more or less discarded the shuttering idea as being a mechanical difficulty. We had gone through the possibilities of germanium shutters and then in this—in this discussion, and while we were sitting there it dawned on one of us that in order to deal with the problem of a train or car in, say, for instance, Maine in a difficult winter condition and a train in Texas where it was warm, you would have to have something that would give you a standard of comparison because heat is a difficult thing to put in a standard condition. We were looking there—I don't know whether it was triggered off by looking at the book, but

it occurred to us that the car was always in the environment of the target and subjected to the same conditions, whether it be in the winter or summer. We might have gone off on the tangent of thinking how we could use the car as a reference in other manners, for instance as taking radiation from it and developing voltages, and things like that, but then one of us in looking at the *Car Builders* manual noticed a darkened area under the car. That seemed to be a good place. It is out of the sun and there is no snow there. And we began considering the feasibility of loking at the bottom section of the car and not putting all of your heat sources of hot brake shoes and hot wheel rims; and it went rather rapidly from that point on to where we would consider looking in such a manner as to get at the bottom of the car for this referencing and still sweep the journal and miss the remainder of the hot sources.

"This alternately was the arrival at the idea of putting it down on the ties and looking up. From that point, I recollect that I marked in the encyclopedia the angle by putting a protractor and drawing a line on it. This constitutes my recollection of how it happened."

On June 25, 1956 the inventors prepared an Invention Disclosure Memorandum which described their concept (1172a):

"• • • the orientation of the detector head • • • is unique and has a number of advantages over other possible wayside orientations • • •.

"• • • undesired heat sources such as hot brake shoes, hot wheel rims, • • • which are normally present on freight cars, are so disposed as to be outside the viewing field of the detector and targets: namely, the journal boxes. Any other possible orientations

of the pyrometer makes the use of complex and delicate shutter mechanisms mandatory in order to blank out the above mentioned undesired heat sources. Devices incorporating shutters present inherent maintenance problems not the least of which is that of maintaining precise synchronism between the shutter and target.

"Shutters are completely eliminated by the plan of figure 2. The pyrometers see only the journal boxes and the underside of the car overhang which is nearly at ambient temperature."

The orientation of the detector head so as to utilize the underside of the car as an external reference permitted the use of the atmosphere or environment in which journal boxes must be scanned, instead of requiring some method of compensating for it. Daylight and night operations, seasonal and daily variations were self compensating (A52-A53).

A memorandum of the Association of American Railroads dated March 15, 1957 states (1078a):

"* * * work on various devices * * * for the now defunct [A.A.R.] Committee on Hot-Box Alarm Devices had generally led to the conclusion that there was no noticeable relationship between journal box and bearing temperatures alone and that wind velocity and ambient temperature would have a pronounced effect on any such relationship.

"Furthermore, to be effective, the hot-box detector would have to have some automatic compensation for changes in ambient temperature. If the Servo Corporation detector contains such compensation, it is not evident from the description of the device."

That the Servo hotbox detector did solve this problem and compensate for changes in ambient conditions is re-

flected in the following statement by a Pennsylvania Railroad employee (1169a):

> "* * * we do not change the adjustment during winter and summer since the Servo is supposed to account for ambient temperature."

It seems plain that the invention of the patent solved the problem of daylight operation; solved the problem of varying ambient conditions; solved the problem of shutterless operation; and solved the problem of extraneous heat sources, all of which the G. E. Company and its leading infra red expert described as "a large order", a "most serious problem", and ones which "might not yield a satisfactory answer." Yet the solution, which was not obvious to these skilled engineers, was obvious to the Court of Appeals in its attempt to interpret this Court's application of the doctrine of a constitutional invention in the A. & P. case to a device such as a supermarket counter! It is inconceivable that this Court intended its ruling in that case to extend to a contribution such as here in issue which supplied the railroads of this country for the first time with a device which solved what the railroads had for years described as "the largest and most important single problem in the field of railroad operations (317a)".

The proof is overwhelming that the conception of Gallagher and Pelino was not simply a commercial success but was in fact recognized, in a very realistic and practical sense, as a unique solution to a long standing problem. In the light of the failure of any of the prior workers to develop a hot box detector that was acceptable to the railroads (pp. 19-21, *infra*) and the fact that the record does not evidence the detection of an actual hot box under regular operating conditions by any of the prior art

devices, the recognition that the claimed invention provided an answer appears to plainly reside in evidence such as that of Ruff, of the Southern Railway stating:

> "This is the first definite indication I have had that it is possible to externally scan a freight type journal and evaluate the heat therein (TR. 2499)".

The General Railway Signal Company, long a major supplier of communication and signalling equipment to railroads, advised the Southern Railway, which was seeking an alternate source of supply, that it doubted it could independently design a better hot box detector for Southern, and significantly stated:

> "• • • we doubt if more development and research would bring about a better method of indicating hot boxes (11174a)".

Youngwerth of the Erie R. R., which had earlier tested an unsuccessful I. T. & T. (Federal Telephone) device, reporting on the ability of the Servo detector to substantially eliminate false signals, stated:

> "This to say the least, is remarkable when compared with the results we experienced with the Federal Telephone & Radio Corporation detector at North Judson (1097a)."

In 1956 when Servo first tested the device and detected a hot box in operation, with railroad personnel observing, it was reported:

> "This provided Mr. Rockwell [PRR] with the substantiation he required that the Detective had the sensitivity and reliability for this difficult job, and was positively able to detect potentially dangerous journals."

Can there be any doubt in the face of this testimony,* all reflecting awareness, on the part of railroad personnel, for the first time, not only of the ability of this claimed invention to avoid the critical disability of false signals, but even of the ability to detect a hot box. We cannot help but ask this Court, in the light of this practical evidence, to consider the basic soundness of the Court of Appeals' reversing conclusion that the device of this invention *"merely performed the same functions more efficiently"* (A6). The same functions as what? More effi-

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* The Servo detector is also characterized in the statements of many railroads as *"one of the most outstanding advances in railroading"* (Reading RR, December, 1956, 1338a); as a *"very forward step in attempting to solve a very difficult problem"* (Motorola Communications and Electronics Inc., April 1957, 1339a); as representing *"the newest method yet devised to help the railroads in their constant struggle to overcome the hotbox problem"* (Boston & Maine Railroad, September-October, 1957, 1344a); as *"one of the greatest aids to railroading in many, many years"* (C & O 1958 Annual Report—PX-76); as *"tremendously successful"* and producing *"solid achievement"* (B & M, 1959, 1346a); as a *"phenomenal success"* (Interstate Commerce Commission—PX-527); and that it was a *"pioneer"* effort (AAR, 1080a).

An economic appraisal by the N & W Railroad estimated the value of a Servo hot box detector as $325,732 per year, stating the figure to be "conservative" and based on "labor and material savings". (1341a).

And finally, in a paper presented before the I.E.E.E. on February 15, 1963, G.E.'s expert witness Menaker paid the following tribute to Servo's and G.E.'s alleged infringing detectors:

> "The hundreds of infrared hot box detectors [Servo and the alleged infringing G.E.] have without question saved railroads millions of dollars in the last few years. * * * Today's hot box detectors have proven their economic worth repeatedly on the roads that have used them. Railroad management estimates of the time required to pay off the investment have been as short as to weeks. Wherever they are in use, hot box detectors have become as vital to railroad operations as the signal or communications systems."

ciently than what? Not one of the prior art devices was ever commercially adopted or even shown to have successfully detected an overheated journal box in regular operation (A85-A86, footnote).

The work of the Siemens Halske Company in Germany (the Johannson patents, 3.35; 2.270); the work of the General Electric Co.; the work of the International Telephone Co.; and others, all was unsuccessful. The German disclosures both utilized choppers as internal references, one was mounted inside the rails and observed the axle, the other was mounted on a tripod and observed lid covers. There is no record of the commercial adoption of these devices.* G.E.'s expert, Cockrell stated, at the outset of his work, after viewing the Servo detector, "we are going ahead with the development of a hot box detector which does not follow the principles" of the German system (1271a).

The General Electric Company, through its experts, Canada and Warshaw, commenced what they termed a "pioneer" development in 1952 (1252a). The nature of the experimental and development work conducted by them is described in two reports (978a, 1115a) and reveals a mounting which exposed the heat sensing element to hot wheel rims, brake shoes and to variable temperature backgrounds. Noting the problem of horizontal viewing from a pedestal mounted detector Warshaw concluded (978a) that the detector must be installed in an area that will afford protection against low-level sunlight, recommending the location of detectors "* * * in a *cut-through* that will provide adequate shielding from low-level sunlight * * *", or as an alternative arrangement the construc-

* Servo's Petition for Rehearing, Vol. XIII of Certified Record, pp. 115-118.

tion of a natural barrier *"13 feet high"* for a single track or a natural barrier *"15 feet high"* for a double track installation. An admission of total failure of the Canada-Warshaw development effort appears in a 1955 hotbox detector specifications prepared by Canada (1269a):

> "A set of normally open and normally closed contacts are provided on an output [alarm] relay which operates momentarily each time the bolometer detector 'sees' a signal from a passing hot journal on a train *or from another equally hot spot such as brake shoes or a wheel tire."*

This work was summed up by G.E.'s witness, Cockrell, as a device which G.E. would not offer to a railroad (A106).

A further independent effort to solve the hotbox detector problem was made in 1954 by engineers in G.E.'s X-ray Department at Milwaukee, Wisconsin, who also built and tested a pedestal or tripod mounted detector having a viewing axis oriented in a horizontal plane at right angles to the track (1120a). This detector system was tested on the Milwaukee Railroad and the failure of this group of G.E.'s engineers also to build a detector which would satisfactorily discriminate against sunlight and other spurious heat sources is expressed in their 1954 report as follows (1120a):

> "• • • The signals due to the brake shoes can be discriminated against but *short of direct shielding of the journal from the sun's radiation there appears to be no satisfactory answer to the latter."*

During the period 1953-1957, International Telephone & Telegraph Co. tested an infrared hotbox detector which was also pedestal mounted with the viewing axis oriented in a horizontal plane as right angles to the track. One of the features of this detector was a mechanical shutter

which is arranged to open and expose the detector to only journal box lids and remain closed at all other times. The nature of the effort put forth by International Telephone & Telegraph Co. was substantial (1443a):

> "At this writing [I.T.&T.] has expended over $100,000 in developing the invention and has employed from approximately two to ten men almost full time on this project alone since 1953."

The device was unsuccessful and abandoned (PX-198):

> "Hot box detector which the Erie tested was developed by the Farnsworth Electronics Company and offered to the railroad industry by Federal Telephone and Radio Company. It was the intention of the Erie to lease the equipment, as per copy of the October 15, 1956 agreement attached, and to our knowledge no detectors were ever sold by his company. * * *
>
> "The only advice received from the Federal people concerning their future plans in connection with this equipment is that they do not anticipate reinstalling it or conducting any further tests in the foreseeable future."

The General Superintendent of Communications and Signals of the Erie Railroad later reported (1097a):

> "* * * concerning performance of Servo hot box detectors as reported in the current issue of Railway Signaling and Communications.
>
> "In recent months I have discussed this matter with several of the Signal Engineers whose road employs above devices. In each case they advised excellent results being received and claim that of the total number of detector actuations only 20% were false or nothing found actuation. *This to say the least, is remarkable when compared with the results we experienced with Federal Telephone & Radio Corporation detector at North Judson*",

No other conclusion can be drawn from such record facts but that the subject matter of the '309 patent provided, in the complicated field of infra red technology, a solution to a long-standing serious problem, involving the derailment of railroad cars and damages running into millions of dollars, and was recognized as an answer, not merely by the commercial adoption of the device, but by the record statements of electronic and railroad engineering personnel. This result was accomplished by Gallagher and Pelino after recognized expert engineers and large, scientifically oriented companies, including G. E. itself, actually tried to produce a satisfactory result; working with the same materials and sources;* failed; and abandoned their experimental efforts.

ARGUMENT

The Court of Appeals' opinion states (A5):

> "We simply hold that the standard of invention as applied by the master and the district court is not up to the legal standard required by the governing statute, 35 U.S.C.A. § 103."

As we believe we overwhelmingly demonstrated in the Petition for Rehearing the statements of fact in the Court of Appeals' opinion are directly contrary to the specific evidentiary findings of both the master and the district court, and to the substantial weight of the evidence. This is patently apparent from an examination of the Petition for Rehearing** and, as objectively as we are capable

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* A88-A91.

** Vol. XIII, Certified Transcript of Record in Court of Appeals, pp. 91-134.

of considering it, we cannot comprehend the Court of Appeals' statement that "the basic facts are not seriously in dispute." (A5) Sharp proof of the dispute, which was resolved by the triers of fact in favor of petitioner, is the fact tha G.E. filed 200 separate objections to the master's Report, more than a hundred of which were directed to the findings of fact relating to the invention of the '309 patent, contending that the master was incorrect on the facts.

The findings of fact by the master and the district court (and if there is no dispute as to the facts, these are a valid basis for examining the question of invention) and the record facts set forth in the Statement herein (pp. 7-17, *supra*) plainly show that the invention under examination more than meets the "severe test" of this Court in the *A. & P.* case and overwhelmingly meets the "objective" or "factual" test formulated in recent years by Judge Learned Hand in *Reiner* v. *The I. Leon Co., Inc.*, 285 F.2d 501, 503-504 (C.A. 2, 1960):

> "The test laid down is indeed misty enough. It directs us to surmise what was the range of ingenuity of a person 'having ordinary skill' in an 'art' with which we are totally unfamiliar; and we do not see how such a standard can be applied at all except by recourse to the earlier work in the art, and to the general history of the means available at the time. To judge on our own that this or that new assemblage of old factors was, or was not, 'obvious' is to substitute our ignorance for the acquaintance with the subject of those who were familiar with it. There are indeed some sign-posts; e.g. *how long did the need exist; how many tried to find the way; how long did the surrounding and accessory arts disclose the means;*

> *how immediately was the invention recognized as an answer* by those who used the new variant? In the case at bar the answers to these questions all favor the conclusion that it demanded more intuition than was possessed by the 'ordinary' workers in the field. The needs were known, but the purpose to fulfill them with that minimum of material and labor disclosed in the patent had not appeared; * * * the existing devices at once yielded to Reiner's disclosure; his was an answer to the 'long-felt want'."

In *Great Atlantic & Pacific Tea Co.* v. *Supermarket Equipment Corp.*, 340 U. S. 147 (1950), the last case in which this Court considered the basic question of invention, it was stated (p. 152):

> "The conjunction or concert of known elements must contribute something; only when the whole in some way exceeds the sum of its parts is the accumulation of old devices patentable. Elements may, of course, especially in chemistry or electronics, take on some new quality or function from being brought into concert, but this is not a usual result of uniting elements old in mechanics. This case is wanting in any unusual or surprising consequences from the unification of the elements here concerned, and there is nothing to indicate that the lower courts scrutinized the claims in the light of this rather severe test."

Infra red heat sensing devices were not new. Neither was the serious problem of trying to use them for the purpose of detecting overheated journals on railroad cars. The invention of the '309 patent accomplished for the first time the desired result, using as the master put it, "the tools at hand", and was new and "unusual". The record reflects that some engineers thought the task was

"impossible"; that leading experts were uncertain that the technical problems would ever "yield satisfactory solutions"; that after the event, the result was described in the industry as "remarkable". The record reflects that experts had tried, using the tools at hand and could not produce the result. This case is not wanting in "unusual consequences" and meets the "severe test" prescribed by this Court.

This Court further noted (p. 149) that the Court of Appeals in the *A. & P.* case:

> "• • • identified no other new or different element to constitute invention • • •."

The invention of the patent in suit was the only such device to utilize, as a new element, the environment of the target itself, the underside of the car in conjunction with an orientation of the device which constantly exposed it upward towards the sky. As the inventor noted: "It is virtually impossible to achieve the results we are obtaining unless the bottom of the car is used as a reference to which journal temperature is compared. Therefore the orientation [which at the same time avoided other heat sources on the train] is the key to the entire system". As the master found:

> "This was the discovery of the fact that using the tools at hand a device could be made and so oriented as to successfully scan and record only hot journal boxes, to the exclusion of all unwanted and disturbing signals and this could be done by taking advantage of the fact that the underside of the cars provided a uniform reference background."

This case is not wanting in the identification of a new or different element to constitute invention.

CONCLUSION

For the reasons stated this Petition for Certiorari should be granted.

Respectfully submitted,

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